

Research Paper

What Questions do People Ask on a Human Papillomavirus Website? A Comparative Analysis of Public and Private Questions

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Abstract

Objective: In 2004, we launched the question and answer (Q&A) section on a human papillomavirus (HPV) website (www.hpvkorea.org) that provides ample and regularly updated information about HPV. The purpose of this study is to collect data pertaining to questions posed on this website about HPV and its related diseases and analyze the type of questions and frequency before and after introduction of HPV vaccine in Korea. Using these results, we intend to determine the clinical and practical implications for doctors treating HPV and for HPV website providers.

Method: Data were collected from March 2004 to July 2011. This study analyzed all the questions that were asked on the website during this period. The questions were categorized into 2 groups, according to whether they were asked publicly or privately. The 10 categories for classification were determined on the basis of the contents of the questions by 4 researchers with medical degrees (Ph.D.) related to HPV research. The frequency of the questions was separately determined for the public and private question formats. Also, we compared the type of questions and frequency before and after introduction of HPV vaccine in Korea and evaluated the changes in the 2 groups over the 2 periods studied.

Results: Of the 3,062 subjects who visited the HPV website, 2,330 subjects asked public questions and 732 asked private questions. The most frequent question was "I have been infected with HPV, and I want to know about the treatment options for HPV infection and cervical dysplasia" (n = 1156, 37.8%), and the second most common question was "What are the transmission routes of HPV?" (n = 684, 22.3%). The third most common question was "How long does it take for HPV infection to spontaneously remit?" (n = 481, 15.7%).

Of the 2,330 public questions, the most common question types pertained to the treatment of HPV and cervical dysplasia, HPV transmission, HPV remission, and risk of cervical cancer (in that order). Of the 732 private questions, the most frequent question types pertained to the HPV transmission, treatment of HPV and cervical dysplasia, genital warts, and HPV & pregnancy (in that order). The type and frequency of public and private questions showed statistical differences between the 2 groups (p < 0.001).

Conclusion: Our results show that when people consult an internet site about HPV, they actually want to seek about "treatment of HPV and cervical dysplasia", "HPV transmission", "HPV remission", "genital warts", and "risk of cervical cancer" (in this order). Also, our results showed that "genital warts" and "HPV & pregnancy" may have been considered embarrassing topics. Thus, these findings can be used to make informed recommendations for future clinical or internet-based communications with patients and the general public.

Key words: human papillomavirus; cervix; genital warts; dysplasia

Introduction

Cervical cancer is the second most common cancer in women in developing countries worldwide [1] and the fourth most common cancer in Korean women [2]. HPV is known as a causative agent of cervical cancer, and the overall prevalence of HPV infection is 10–15% in Korean women. The incidence of cervical cancer in Korean women is 15 per 100,000, and the overall 5-year survival rate is 78% [3]. The Papanicolaou smear (Pap smear) test has remarkably decreased the incidence of cervical cancer by aiding in the early diagnosis and treatment of precancerous lesions [4].

Despite the considerable efforts made for preventing cervical cancer, low levels of knowledge on HPV have been noted in women, ranging from adolescents to old women [5-8]. Although the Pap smear is the main tool used in cervical cancer screening programs, a recent telephone survey showed that only approximately 55% of Korean women underwent the Pap smear in 2005 [3]. In 2007, the HPV vaccine was approved for use in women in Korea, but the vaccine is not easily available because of its high cost and lack of government funding. The availability of the HPV vaccine has made women curious about HPV, but few resources are available to satisfy this new curiosity [9].

Korea has well-developed information technology and internet infrastructure. Most Korean women can easily obtain medical and health-related information through web portals. When Koreans require health-related information, 75% of them obtain it through the internet; 13%, through television or advertisements; and 7%, through consultations with doctors [10].

With this background, we set up an HPV information website (www.hpvkorea.org) as a public service and launched a question and answer (Q&A) interface. In Korea, which has Confucianism-based culture, public conversation about sexual behavior is traditionally considered taboo [11]. Therefore, we hypothesized that public discussions or questions about HPV are not liberal and expected a significant difference between the type and frequency of public and private questions on HPV websites.

The aim of the present study is to collect data pertaining to questions asked about HPV on this website and compare the type of questions and frequency before and after introduction of HPV vaccine in Korea. Using these results, we intend to provide information regarding both clinical and practical implications of the data to doctors and HPV website providers.

Materials and Methods

In 2004, we designed the HPV Korea website, which mainly focused on Q&As regarding HPV and its related diseases, as a public service. Four of the administrators of the website have performed clinical and translational research on HPV and received a Ph.D. from medical school. Currently, all these 4 members are working as gynecologists at university hospitals and are involved in answering questions on the HPV Korea website.

Every visitor is required to log in using a username and password for submitting a question and can select the public or private question mode for the question. The public questions can be viewed by all website guests; however, private questions are accessible only on using the questioner's own password. Private questions are marked with a red square in the Q&A section so that they can be distinguished from public questions. On the Q&A page, we have mentioned "Public rather than private questions are requested" to encourage information sharing by visitors.

Data pertaining to all the questions asked between March 2004 and July 2011 were collected and analyzed. All the questions submitted on the HPV website were in Korean and were in free-text style. The text was translated from Korean into English at the time of manuscript preparation. Initially, the 2 main authors reviewed the 200 most recent questions asked on the website. These 200 questions were categorized on the basis of themes in the questions; consequently, we found 22 themes, which have been listed in Table 1. The 22 themes have been shown in bold font; they were merged into 10 categories because some of them overlapped in terms of meaning and content. Next, the 2 researchers independently performed the coding process, and they agreed on the results for most of the questions. Conflicting results were discussed until all the researchers reached a consensus. In our study only 2 topics were unrelated, for example, "I hope to receive a quick answer as soon as possible", and could not be coded. Therefore, we excluded these 2 questions from our data analysis.

Subsequently, the questions were divided into 2 groups according to the public and private question types. On the basis of these criteria, we evaluated the type and frequency of the questions and investigated the differences between the 2 groups. During further analysis, we divided all the questions into 2 groups according to the period in which they were asked and evaluated the changes in the type and frequency of these questions. The first period was 2004–2007 and the second period was 2008–2011. The type and fre-

quency of the questions were ranked in descending order.

We compared the type and frequency of both types of questions and evaluated the changes in the 2 groups over the 2 periods studied. Because the parameters of the 2 groups were nominal scales, the chi-square test were used to evaluate statistical differences between the parameters for the 2 groups. Statistical analysis was performed using the SAS program, version 8.0. P values of <0.05 were defined as significant.

Results

The 10 categories for the themes and examples of questions with themes from different categories are shown in Table 1. From 2004 to 2011, the number of questions asked on the website was 3,062, consisting of 2,330 public questions and 732 private questions.

Of the 3,062 questions, the most frequent question was "What treatment is required for HPV infection and cervical dysplasia?" (n = 1,156, 37.8%), and the second most common question was "What are the transmission routes of HPV infection?" (n = 684, 22.3%). The third most common question was "How long does it take for HPV infection to spontaneously remit?" (n = 481, 15.7%). The fourth most common question was "Why do genital warts frequently recur even after successful treatment?" (n = 174, 5.7%; Table 1). These 4 questions accounted for more than 75% of all the questions asked on the HPV Korea website.

Of the 2,330 public questions, the most common question types pertained to the treatment of HPV and cervical dysplasia, HPV transmission, HPV remission, and risk of cervical cancer (in that order). Of the 732 private questions, the most frequent question types pertained to the HPV transmission, Treatment of HPV and cervical dysplasia, genital warts, and HPV & pregnancy (in that order). The type and frequency of public and private questions showed statistical differences between the 2 groups (chi-square test, $p < 0.001$; Table 2). On determining the ranking of public and private questions, we found that 5 questions had a gap of more than 3 ranks between the private and public question formats. Two questions, i.e., those on "HPV & pregnancy" and on "genital warts", had higher ranks as private questions, and 3 questions, i.e., those on "prevention of HPV," "vaginal discharge," and "risk of cervical cancer" had higher ranks as public questions.

During the first and second periods, 1,990 and 1,072 questions, respectively, were asked. The proportion of private questions was 21.6% during the first period and increased to 28.2% during the second period (chi-square test, $p < 0.001$; Fig. 1). During the second period, the frequency of questions related to "genital warts," "HPV vaccination," and "HPV & pregnancy" was higher than that in the first period (Fig. 2). The question regarding "HPV vaccination" was ranked 6th in the second period and 7th in the first period.

Table 1. Categories and examples of questions from the HPV Korea website

Categories	Examples of questions	Number	Rank	%
1. Treatment of HPV and cervical dysplasia	Is HPV curable?, Which treatment would you recommend for HPV infection?, What is the best treatment for my condition (e.g., cervical dysplasia)?	1156	1	37.8%
2. HPV transmission	I want to know about the transmission routes and the duration of HPV infection. Can I infect other people with HPV by sharing a towel or bowl of soup ? Have I acquired HPV infection from my partner ? Can my skin wart move to genital areas? Can my genital wart move to my baby during lactation ?	684	2	22.3%
3. HPV remission	How long does it take for HPV infection to spontaneously remit ? Does negativity on HPV DNA test really indicate HPV clearance from my body?	481	3	15.7%
4. Genital warts	Why do genital warts frequently recur even after successful treatment? If I find a small mass on genital area , is it a genital wart?	174	4	5.7%
5. Risk of cervical cancer	What is the risk of cervical cancer after HPV infection ? What is the risk of cervical cancer from cervical dysplasia ?	147	5	4.8%
6. HPV vaccination	How effective is HPV vaccination? Which company vaccine is more effective for HPV prevention? When will therapeutic vaccination be available in clinics?	116	6	3.8%
7. Prevention of HPV	Is there anything I can do to prevent HPV infection ? Which foods are good for the prevention of HPV? Can a condom always prevent HPV infection?	90	7	2.9%
8. Vaginal discharge	Is vaginal discharge related with the symptoms of HPV infection?	86	8	2.8%
9. HPV & pregnancy	Can HPV be transmitted from the mother to the baby during pregnancy ?	81	9	2.6%
10. Laryngeal cancer & HPV	If I feel a lump or mass in my mouth, is this a laryngeal cancer associated with HPV?	47	10	1.5%

Table 2. Comparative analysis of the type and frequency of public and private questions

Categories	Public questions (N=2,330)			Private questions (N=732)		
	Number	%	Rank	Number	%	Rank
1. Treatment of HPV and cervical dysplasia	964	41.4%	1	192	26.2%	2
2. HPV transmission	478	20.5%	2	206	28.1%	1
3. HPV remission	429	18.4%	3	52	7.1%	5
4. Genital warts	62	2.7%	8	112	15.3%	3
5. Risk of cervical cancer	113	4.8%	4	34	4.6%	7
6. HPV vaccination	72	3.1%	7	44	6.0%	6
7. Prevention of HPV	79	3.4%	5	11	1.5%	10
8. Vaginal discharge	74	3.2%	6	12	1.6%	9
9. HPV & pregnancy	25	1.1%	10	56	7.7%	4
10. Laryngeal cancer & HPV	34	1.5%	9	13	1.8%	8
Total	2,330	100%		732	100%	

The chi-square test was performed to evaluate the distribution of categories between public and private questions; significant differences were observed ($p < 0.001$).

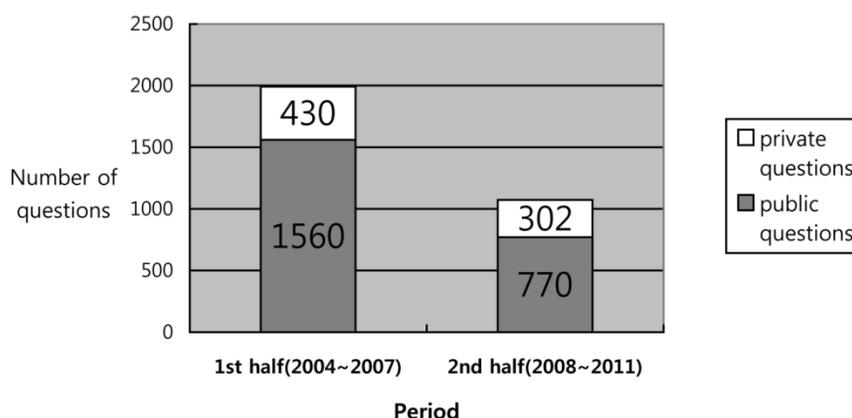


Figure 1. The number of public and private questions according to the time period

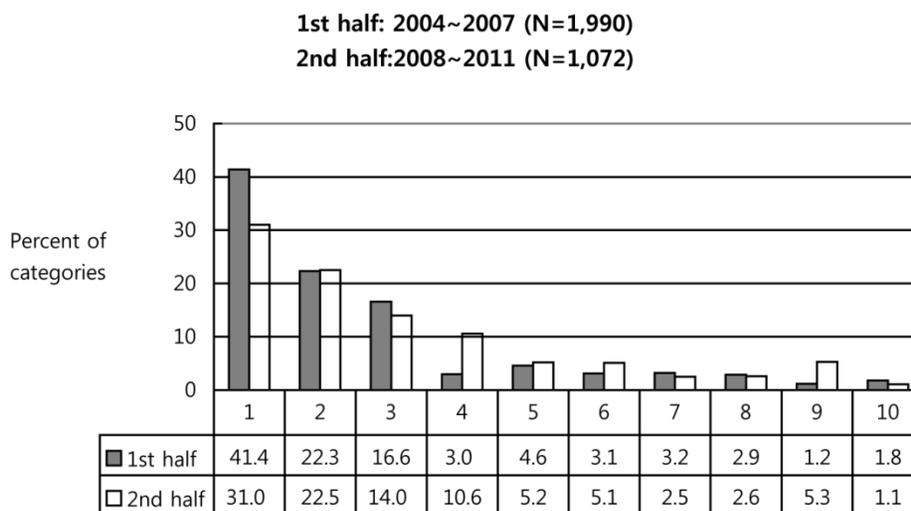


Figure 2. The proportion of ten categories according to the time period (N=3,062)

Discussion

Longitudinal data collected from a HPV website were used in this study. The potential merit of this study is that HPV-related practical questions submitted by online visitors were collected. Thus, we could determine what people really want to know about HPV and its related diseases. To our knowledge, our study is the first to systematically investigate the type and frequency of such questions.

Women aged over 30 years are entitled to free Pap smear tests every alternate year with the support of the National Health Insurance Corporation in Korea [3]. Thus, Korean women have become more familiar with the Pap test terminology and HPV. Recently, many researchers have used written surveys, interviews, and other data collection methods to evaluate knowledge regarding HPV among women. These researchers found that women have a low awareness of HPV and suggested the use of more educational programs [6, 12, 13]. In addition, many patients remain confused after hearing clinicians' explanations regarding HPV [14]. Consequently, many patients browse the internet for information on HPV, but they still have many questions [15]. To resolve this problem, we set up an HPV website for Q&As regarding HPV and its related diseases.

Through the data obtained from the website, we found what women really want to seek when consulting an internet site regarding HPV. Based on the findings, especially on the most frequently asked questions, we found that most people truly want to seek about the whole disease process, i.e., from HPV infection to remission. People naturally wonder about how HPV infection and HPV-related disease should be treated. Our FAQs are similar to those asked in a study by the American Social Health Association (ASHA), where data were collected from emails, letters, lecture questions, and calls [12]. Most of ASHA's questions asked in the ASHA study were about HPV infection, transmission, and treatment, which are similar to the questions from our study. On the basis of these results, we plan to focus on explaining the life cycle of HPV with respect to infection, transmission, and remission in the FAQ section of HPV Korea. Reading the contents of the revised FAQ section will help people understand the life cycle of HPV and also reduce their doctors' efforts in answering repetitive questions.

Interesting results emerged when we compared the type and frequency of public and private questions in our Q&A section (Table 2). Explicit discussions regarding HPV infection are very difficult on a public website because people may sometimes feel

that acquiring HPV infection is disgraceful as it is sexually transmitted. The authors regarded questions that were more frequently asked in private rather than in public as confidential questions. On the basis of the results, we found that 2 categories may have been considered embarrassing topics, i.e., "genital warts" and "pregnancy & HPV". Because these topics can be occasionally considered taboo, they should be carefully discussed in the public format. These results could have implications for clinical practice and internet-based patient outreach.

From data on temporal cohorts, the proportion of private questions in the second period (2008~2011) increased by 6.6% compared to that in the first period (2004~2007) (Figure 1). We found that the frequency of questions on "genital warts," "HPV vaccination," and "pregnancy & HPV" increased in the second period. We have shown the alterations in the bar chart in Figure 2. Our results indicated that the type of interest and curiosity regarding HPV could change over time. After approval of HPV vaccine use for women in 2007, the number of questions regarding HPV vaccination increased. This is consistent with the results of Kelly's survey, which indicated increase in the level of public knowledge about HPV after HPV vaccine approval [9].

The limitations of this study were as follows: We might have influenced the relative number of public versus private questions asked because we, the administrators of HPV Korea, encouraged public questions rather than private questions; this was done to enable maximum possible sharing of HPV-related information. We could not obtain the demographic data of the visitors and evaluate their awareness of HPV. Furthermore, we could not determine what information was being provided to the patients about HPV by doctors in clinics.

In conclusion, our results show that when people consult an internet site about HPV, they actually want to ask about "treatment of HPV and cervical dysplasia," "HPV transmission," "HPV remission," "genital warts," and "risk of cervical cancer" (in this order). We compared the type and frequency of public and private questions before and after introduction of HPV vaccine in Korea. The results showed that "genital warts" and "HPV & pregnancy" may have been considered embarrassing topics. Thus, these findings can be used to make informed recommendations for future clinical or internet-based communications with patients and the general public. Hence, embarrassing topics about HPV such as condyloma and infection during pregnancy should be approached with great care and advised individually.

Conflict of Interest

The authors have declared that no conflict of interest exists.

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